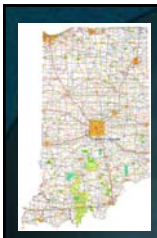
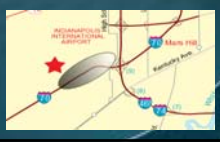
I-70 Fast Track: Relocating Roads, Creeks & Bats at the Indianapolis International Airport

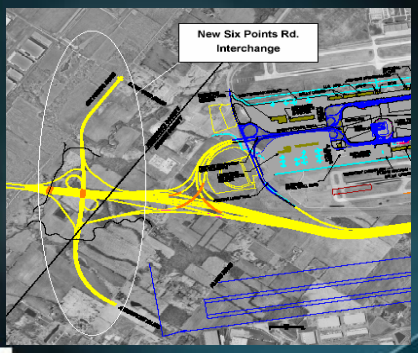
Project Location



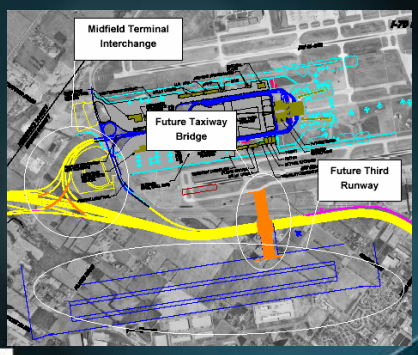


Project Overview

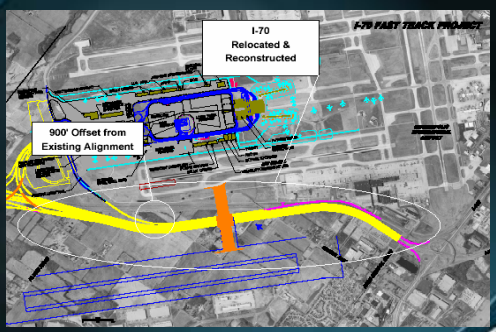
Six Points Road Corridor



Indianapolis Int'l Airport



I-70 Replacement



Fast Track Project

- **Time Constraints -**
  Completion Required by December 2004
- **CD/CI -**
  Continuous Design/Construction Interface
- **Phased Contracts -**
  Let as Design Completed for Each Phase
- **Seven Contracts -**
  Let from October 2002 to September 2003
- **Construction Budget -** $180 Million

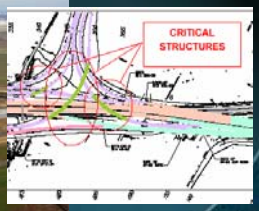
Early Grading Contract

- 2.8 Million Cys Excavation
- 10,000 Feet of 96” Pipe



Critical Structures – Airport Bridges

- 3 Post-Tensioned Box Girder Structures
- Longest Structure is 1,354 Feet

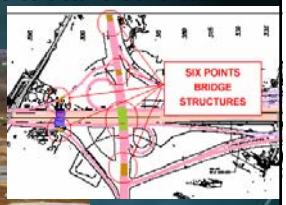



Paving 1

- Mainline Relocation & Airport Ramps
- 420,000 Sys of 15” Pavement


Six Points Bridge Structures

- Six Bulb-T Beam Structures
- 3,600 Cys of QC/QA Superstructure Concrete

Six Points Roadway

- 182,000 Sys of Concrete Pavement


High School Road & Bridge

- Structure Raised > 5 Feet for New I-70 Section
- Major Utility Relocations Required

Paving 2

- Final Pavement Tie-Ins & Markings
- Sign, Lighting, & ITS Components
- Extensive MOT

Project Partners

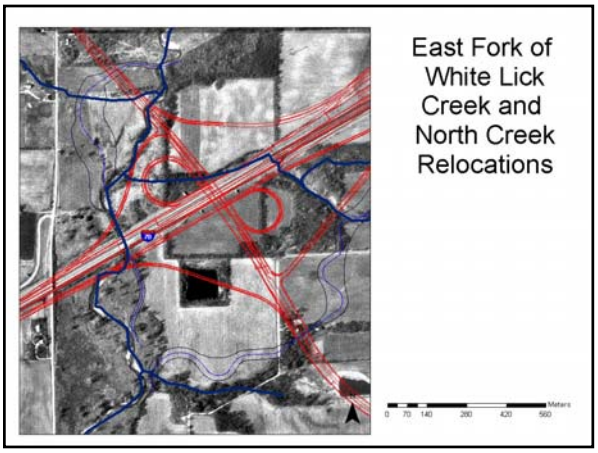
- INDOT – Project Lead
- IAA – Primary Land Owner
- City of Indianapolis – Secondary Roads
- Hendricks County & Town of Plainfield
- USFWS, COE, IDEM, IDNR
- Private Developers

Environmental Issues, Impacts, and Designs

- Creek Channel Relocation
- Indiana Bat & HCP
- Wetlands Mitigation
- Erosion and Sediment Control

Why Relocate Creeks???

- Multiple project components with long time frames for construction all in same project vicinity
- Reduce long-term construction impact to streams
- Reduce number of culverts and bridges



East Fork White Lick Creek

North Creek

Construction in a Floodway

- Used coordinate discharges from IDNR to establish 100-year floodway and HECII to model channel
- TR-20 was used to establish 100-year discharge
- Final design included inputs from environmental and hydraulics to design channel

Construction in a Floodway

- North Creek originally designed to accept flow from I-70
- Existing I-70 bridge over EFWL is undersized
- Upstream flooding resulted in purchase of flood easement for East Fork of White Lick Creek
- Permits obtained for both creeks before final design completed

Channel Design - Goals

- Creating a low-flow channel to concentrate discharge during periods of reduced flow
- Vegetating banks with native species to provide stabilization and habitat
- Provide bank protection with rock and wood material placed strategically to establish benthic habitat
- Improve water quality
- Create in-stream fish habitat

Channel Design Criteria

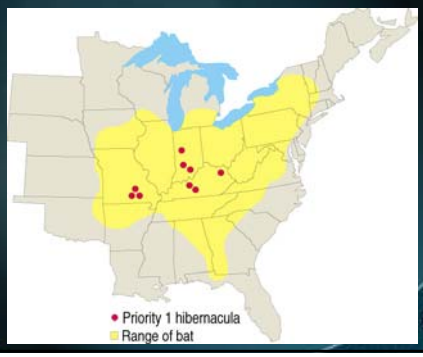
- Develop Existing Hydrologic Analysis and Existing Stream Condition reports
- Analysis of creeks required a predictive hydrologic analysis of existing and future watershed conditions

Channel Design Approach for East Fork of White Lick Creek

- Design Considerations
  - Sand-gravel bed of channel
  - Urbanizing watershed
  - Low gradient nature of the existing stream
- Designed as alluvial channel
  - Developed sediment transport model for sand-gravel channels

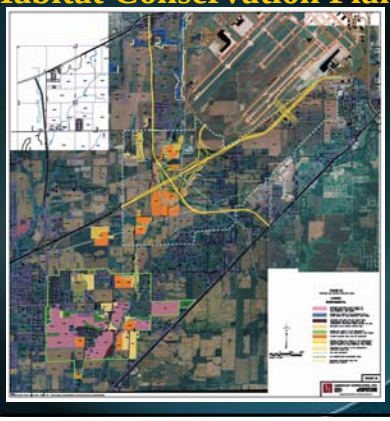
Indiana Bat

Indiana Bat Range



Bat Maternity Colony Tree

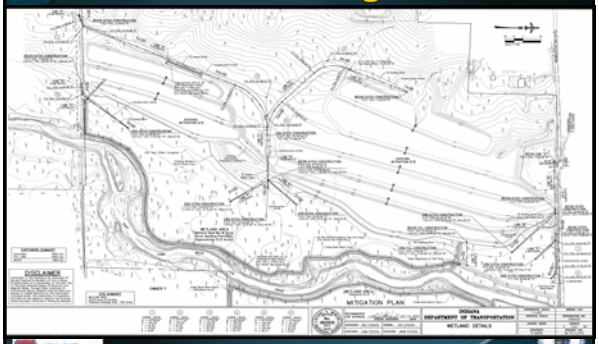
Habitat Conservation Plan



Incidental Take Permit

- Habitat Conservation Plan
  - Limit tree clearing to Sept. 15-April 15
  - Plant 345 acres of new forest, of which approximately half are associated with creek relocations
  - 15-year monitoring program
  - Preserve a minimum of 375 acres of existing habitat
  - Public education and outreach

Wetlands Mitigation



Erosion & Sediment Control

Implementation
Phase I - Grading Contract

- Awarded to Walsh Construction
  October 2002
- Includes:
  - HCP Seedling Plantings
  - 2 Creek Relocations
  - Wetlands Seeding in Creek Floodplains

Implementation
Phase II – Paving 2 Contract

- Awarded to Berns Construction
  September 2003

Includes:

- Completion of HCP Mitigation Plantings
- Wetlands Mitigation Construction

Phase I - HCP Mitigation

- 105 Acres Planted Spring 2003
  - 46,300 Seedlings
  - 21 Species
  - 6 Locations
  - $250,000

Phase II - HCP Mitigation

- 264 Acres to be Planted – Spring 2004 - Spring 2005
  - 217,800 Seedlings
  - 37 Selected Species
  - $800,000 Estimated Cost
  - Revisions Based on Experience in Phase I

Phase II - HCP Mitigation

- Seedling Fields within Six Points Interchange

Creek Relocations Grading Contract

- 11,500 Feet of Creek Channels Relocated
- Floodplain Construction – Fall 2002 to Spring 2003
- Low Flow Construction – Summer 2003 to January 2004

Floodplain Construction

- 540,000 Cys Excavation

Floodplain Construction

- Temporary Diversion Channels

Floodplain Construction

- Temporary Stream Crossings

Low Flow Construction

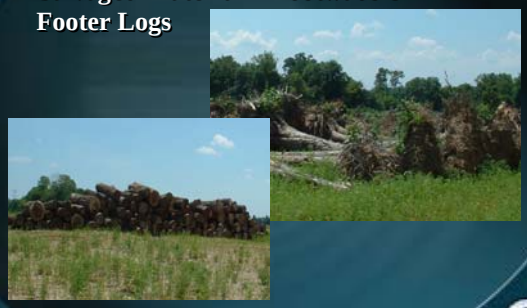
- "Naturalized" Channels – Series of Pools & Riffles
  - 20,000 Tons of Stone for Riffle Grade Controls
  - 600 Rootwads for Bank Protection and Habitat
  - 4,500 Feet of Brush Layering along Banks
  - 37,000 Live Stake Willow Plants

Low Flow Construction

- 62,000 Cys Creek Excavation Within Floodplains

Low Flow Construction

- Salvaged Material – Rootwads & Footer Logs



Low Flow Construction

- Rootwad Bank Protection

Low Flow Construction

- Riffle Grade Control & Pool

Low Flow Construction

- Cross Vane Structure

Low Flow Construction

- Original Completion Scheduled – Spring 2003
- Delayed Completion – January 2004
  - Plan Development vs. Fast Track
  - Subcontractor Selection
  - Unexpected Soil Types/Plan Revisions
  - Unusually Heavy Rainfalls

Low Flow Construction

- Diversion Channel After Storm Event

Low Flow Construction

- New North Creek Channel Completed

Low Flow Construction

- EFWL Nearing Completion – December 2003

Wetlands Mitigation Paving 2 Contract

- Let – September 2003
- 22 Acres of Scrub Wetlands
- 18 Acres of Forested Wetlands
- Estimated Cost over $1,000,000
- Completion in 2004

Erosion & Sediment Control Effective Planning & Management

- Consistent Plan for Entire Project
- Early Review by Environmental Agencies
- Education of Bidders during Pre-Bid
- Effective On-Site Management by E & SC Consultant
- Weekly Site Visits & Review by IDNR
- Flexibility as Needs Change

Erosion & Sediment Control

- 12 Temporary Sediment Basins

Erosion & Sediment Control

- 2,000 Feet of Temp. Slope Drains
- 7,800 Tons of Riprap for Check Dams and Sediment Traps

Erosion & Sediment Control

- 8,000 Feet of Temporary Interceptor Ditches

Erosion & Sediment Control

- Maintain 40' Buffer Along Existing Creeks
- 27,700 Feet of Silt Fence

Erosion & Sediment Control

- Continuous Temporary Seeding Operations

Project Costs

To Date	HCP Mitigation	505,000
	Creek Relocations	11,230,000
	E & SC	250,000
		11,985,000
Remaining	HCP & Wetlands	1,789,000
	TOTAL =	$13,774,000

(7.6% of Project Budget)

Environmental Permits

- Section 404 Permit from US Army Corps of Engineers
- Section 401 Water Quality Certification from IDEM
- Construction in a Floodway from IDNR
- Habitat Conservation Plan/Incidental Take Permit from US Fish and Wildlife Service
- Rule 5 Erosion Control

HCP Plantings

HCP Web Site

http://midwest.fws.gov/nepa/SixPoints/index.html

Permit Requirements

- Section 404 & 401
  - Study hydraulics and hydrology and revise plans as necessary
  - Establish baseline and monitor creeks after construction for 7 years
  - Success criteria
    - Fish and macroinvertebrate communities equal to or greater in quality in the relocated portion than the baseline
    - Riparian Corridor that meets or exceed the pre-construction IBI & QHEI
    - Reconstructed channel meets the grade, hydraulic capacity, and basic channel geometry of impacted channel
    - Water quality the same or better in relocated channel

Wetlands Monitoring

Current Status

- More than 2.8 million cys have been moved
- 96” Outfall pipe is complete
- All utilities have been relocated
- Low Flow Channel work is complete
- Bridge & pavement construction is in progress
- Open to traffic expected by December 2004

Questions